

**CLAIMS**

1. Bovine vaccine formula against bovine  
respiratory pathology, comprising at least three  
5 polynucleotide vaccine valencies each comprising a  
plasmid integrating, so as to express it in vivo in the  
host cells, a gene with one bovine respiratory pathogen  
valency, these valencies being selected from the group  
consisting of bovine herpesvirus, bovine respiratory  
10 syncytial virus, mucosal disease virus and type 3  
parainfluenza virus, the plasmids comprising, for each  
valency, one or more of the genes selected from the  
group consisting of gB and gD for the bovine  
herpesvirus, F and G for the bovine respiratory  
15 syncytial virus, E2, C + E1 + E2 and E1 + E2 for the  
mucosal disease virus, HN and F for the type 3  
parainfluenza virus.
2. Vaccine formula according to Claim 1, which  
comprises the four polynucleotide vaccine valencies.
- 20 3. Vaccine formula according to Claim 1 or 2,  
which comprises the bovine herpesvirus gB and gD genes,  
in the same plasmid or in different plasmids.
4. Formula according to Claim 1 or 2, which  
comprises the bovine respiratory syncytial virus F and  
25 G genes, in the same plasmid or in different plasmids.
5. Vaccine formula according to Claim 1 or 2,  
wherein the plasmid for the mucosal disease virus  
comprises the E2 gene.
6. Vaccine formula according to Claim 1 or 2,  
30 wherein, for the type 3 parainfluenza virus valency, it  
comprises the HN gene in one plasmid or all the genes  
encoding HN and F in the same plasmid or in different  
plasmids.
7. Vaccine formula according to all of Claims 1 to  
35 6.
8. Vaccine formula according to any one of Claims  
1 to 7, which comprises from 10 mg to 1 mg, preferably  
from 100 ng to 500 µg, still more preferably from 1 µg  
to 250 µg of each plasmid.

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9. Use of one or more plasmids as described in any one of Claims 1 to 8, for the manufacture of a vaccine intended to vaccinate bovines first vaccinated by means of a first vaccine selected from the group consisting of a live whole vaccine, an inactivated whole vaccine, a subunit vaccine, a recombinant vaccine, this first vaccine having the antigen(s) encoded by the plasmid(s) or antigen(s) providing cross-protection.

10. Vaccination kit grouping together a vaccine formula according to any one of Claims 1 to 8, and a vaccine selected from the group consisting of a live whole vaccine, an inactivated whole vaccine, a subunit vaccine, a recombinant vaccine, this first vaccine having the antigen encoded by the polynucleotide vaccine or an antigen providing cross-protection, for an administration of the latter in first vaccination and as a booster with the vaccine formula.

11. Vaccine formula according to any one of Claims 1 to 8, accompanied by a leaflet indicating that this formula can be used as a booster for a first vaccine selected from the group consisting of a live whole vaccine, an inactivated whole vaccine, a subunit vaccine, a recombinant vaccine, this first vaccine having the antigen encoded by the polynucleotide vaccine or an antigen providing cross-protection.